Role of empowerment and sense of community on online social health support group

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Abstract

Purpose – Drawing on the taxonomy of patient empowerment and a sense of community (SoC), the purpose of this paper is to analyze the factors that impact the intention of the individual to continue using online social health support community for their chronic disease management.

Design/methodology/approach – A survey design was used to collect the data from multiple online social health support groups related to chronic disease management. The survey yielded a total of 246 usable responses.

Findings – The primary findings from this study indicate that the informational support – not the nurturant support such as emotional, network, and esteem support – are the major types of support people are seeking from an online social health support community. This research also found that patient empowerment and SoC would positively impact their intention to continue using the online health community.

Research limitations/implications – This study utilized a survey design method may limit precision and realism. Also, there is the self-selection bias as the respondents self-selected themselves to take the survey.

Practical implications – The findings can help the community managers or webmasters to design strategies for the promotion and diffusion of online social health group among patient of chronic disease. Those strategies should focus on patient's empowerment through action facilitating and social support and through creating a SoC.

Originality/value – An innovative research model integrates patient empowerment and a SoC to study patient's chronic disease management through online social health groups to fill the existing research gap.

Keywords E-health, Community, Social media

Paper type Research paper

1. Introduction

The rapid growth of social media is changing how individuals, businesses and government communicate, interact and collaborate. It has become an indispensable part of the daily life of people all around the world. With well over 2bn members on Facebook alone (Facebook Newsroom, 2017, June 27) and with almost 70 percent of all internet users using some form of social media (Patel *et al.*, 2015), this technological platform has provided patients a new medium to exchange health-related information (Hawn, 2009). This synergy between the social media and the medical field has changed how healthcare consumers are managing their healthcare needs. The social media with its ability to transcend time and space barriers has also altered the degree to which patients share information and support with other patients that experienced similar issues (Seçkin, 2011). People are slowly buying the idea of sharing personal health-related information in the online health social support groups. The access to immediate information and support from other patients experiencing similar conditions through a technological platform that one has experience using is enticing for the patients. The swift diffusion, lower cost, instant connectivity and broad availability of these social media platforms and online social health support groups (OSHSGs) make them novel avenues for information acquisition and emotional support.

Traditionally, in-person group-based peer support programs have been proven to be effective in regard to changing behaviors, providing informational and emotional support

and a patient empowerment to manage their disease (Woodruffe *et al.*, 2015). However, such programs have a consistently lower attendance in between 30 and 48 percent because such services must be offered at fixed and limited times and locations (Schwennesen *et al.*, 2016; Neubeck *et al.*, 2012). With social media becoming ubiquitous all around the world, OSHSG has become a solution to the existing problem of accessing traditional group-based program for the management of chronic disease.

The use of social media as an OSHSG has become increasingly prominent in health and healthcare. A recent US-based survey reported that almost two-thirds of the health-consumers sought information on health professionals and disease on social media (SMA, 2017, August 2). Another report suggests that almost half the health consumers have considered suggestions from social media when making health-related decisions and 20 percent of them have joined a health-related cause (Dyrda, 2016, February 25). There has been a rise in the older adults aged 65 years and above using social media with 40 percent of them having two or more chronic disease conditions (Australian Institute of Health and Welfare, 2017). In total, 90 percent of these older adults have been found to be using social media to search and share health information (Tennant *et al.*, 2015). Such proliferation of social media along with trust on it has led to an emergence of a new era of an innovative healthcare information delivery where patients are expected to play an active role to manage their own healthcare (Anderson and Funnell, 2005). However, this requires more than a commitment toward health. Chronic patients need instrumental support, psychosocial support and relational support from different sources to manage chronic condition (Dwarswaard *et al.*, 2016). Self-management support of the chronic disease requires healthcare professionals, friends, family, relatives and fellow patients to fulfill their own role.

The use of online social group as a support group for chronic disease management is still in its infancy, with robust and consistent evidence on the outcome yet to be available (Partridge *et al.*, 2018). While several research studies on publicly accessible, peer-led groups on a larger multi-component mobile health program (mhealth) have been consistently performed, there has been a limited study on chronic disease support groups on social media (Partridge *et al.*, 2018). Several of these studies use research methodology collects data from general individuals that range from undergraduate students, to women, to investment bankers and sport players (Oh and LaRose, 2016; Oh *et al.*, 2013; Ahadzadeh *et al.*, 2015; Park *et al.*, 2014). Some of these studies primarily focused on the factors affecting knowledge contribution in online health communities (Zhao *et al.*, 2015). However, little is known is known about the implications of knowledge sharing in an online community for health self-management (Bernardi and Wu, 2017).

To address the gaps in the current literature, this study has created a conceptual research model that allows us to understand the factors that motivate patients/individuals to continue using online social support group for their chronic disease management. This is the primary research question that that will be investigated in this research paper. This paper deals with two key aspects that may explain the patients continued use of online social support group: patient empowerment and a sense of community (SoC). This study proposes that as the patient feel more empowered to manage their chronic disease and feel a SoC, they would like to continue using an online social support group. An online support group is usually created by people who have correlation experiences (Lin *et al.*, 2015). In the case of a patient with chronic disease, such experiences change into sharing of instrumental information from one who has it to the one who has not. The people providing information support may not always stay with the social group and thus, the importance of the nurturant support is very important (Chiu *et al.*, 2015). Nurturant support in a social group implies one subject providing comfort or consolation to another without a direct intention to solve the problem (Cutrona and Suhr, 1994). Both types of support would provide patients with certain empowerment in managing their own chronic disease. Also, based on community psychology research, this study proposes that individuals

would continue using the online social group as long as they feel a sense of belonging to this group (Hou and Fan, 2010). The sense of belongingness to a community is a fundamental motivation that comes from a compatibility with the group. Thus, one of the primary objectives of this paper is to study how the sense of belongingness to the community may impact patient's intention to continue using the online social group for chronic disease management.

2. Literature review

Whereas the future for online social health support in chronic disease management appears to be positive, there is a limited concrete indication demonstrating whether and how OSHSG meaningfully advances patient outcomes (Merolli *et al.*, 2013).

The study by Oh and LaRose (2016) investigated how impression management and time spent on message composition shape ways people seek online social support. The findings from this study suggest that people develop a sophisticated message for online social support when they have multiple goals such as providing online support as well as impression management. While the research focused on the factors that motivate people to provide online social support, the respondent of the lab experiment were undergraduate students without a specific health-related support requirement. A similar study was performed by Oh *et al.* (2013) to understand the health self-efficacy using online survey of undergraduate students. Ahadzadeh *et al.* (2015) also used online survey methodology of urban women to find that a positive influence of perceived health risk and health consciousness on health-related internet use. While the online survey and lab experiment research methodology is an efficient way of gathering generalizable data sample, the research on chronic disease management may demand the sample subject to the patients experience chronic disease.

Several research studies on online social support have been performed using content analysis technique on discussion forums and social network communications. Yoo *et al.* (2014) studies the expression and reception of emotional support and well-being of 236 breast cancer patient by tracking, coding, and analyzing their 18,064 messages on a computer-mediated social support group. Wang *et al.* (2012) utilized machine learning content analysis to understand how exposure to emotional and information support predicts an individual's length of participation and stay in an online social group. The study found that the emotional support was positively associated with the length of the stay while the information support was negatively related as motivation to stay had been satisfied.

Similarly, some of the studies focused on how social support may impact online community citizenships behavior. Chiu *et al.* (2015) examined the impact of subjective well-being, community identification, self-esteem, social support and prestige on expectant mothers' online community citizenship behaviors. The study uses an online survey to inspect why the subject shows citizenship behaviors such as altruism, conscientiousness, courtesy, civic virtue and sportsmanship. A similar study by Xu *et al.* (2012) focuses on the impact of members' trusting beliefs, general attitude and desire for relationship building and maintaining impacts their citizenship behavior in terms of knowledge sharing. However, this research was not specifically focused on types of the knowledge sharing such as the online social knowledge support on disease or on psychological stresses. Lin *et al.* (2015) also studied the impact of different types of support on a willingness to provide support. However, this research went deeper into how receiving different types of support such as action-facilitating support and nurturant support lead to a willingness to provide support to other members. Also, this research used the online social group for pregnancy as its subject.

There have been quite a few thematic synthesis and systematic reviews of the previous literature to explain self-management support through the online social group. Some of these studies are performed from the perspective of the patients such as the one by Dwarswaard *et al.* (2016), which found out that chronic patients engage in an online social support group for instrumental, psychological and relational support. Smailhodzic *et al.* (2016) performed a

systematic review of 22 studies that categorized patients' use of social media into emotional, information, esteem, network support, social comparison and emotional expression which leads to improved self-management and control and enhanced psychological and subjective well-being. Other studies are performed from the perspective of healthcare professionals such as the one by De Angelis *et al.* (2018), which found that ease of use and usefulness of the discussion forum by healthcare professionals facilitate chronic disease self-management with patients. At this stage, further study on systematic reviews and thematic synthesis of the self-management online support group is not warranted because of the already existing several studies on meta-analyses (Partridge *et al.*, 2018).

Some research studies have been theoretical in nature providing feedback on how to manage online social groups for the patient. Partridge *et al.* (2018) provided a few key recommendations for future research of online support groups for chronic disease management. The study stated that iterative content development from the constant feedback of target patient population, engagement of healthcare institutions in carving their role on such online social support group and explicitly mentioning the role of the group "champions" can help better chronic disease management.

Several studies have attempted to determine the use and functions of online social media in chronic disease management, using evidence supported by multi-component mobile health programs (Maher *et al.*, 2014; Williams *et al.*, 2014). However, this lack of demarcation of publicly available social media to that of multi-component health programs does not explain different structure these two mediums of communication have and where the power lies on each type of medium of communication (patients vs group "champions") (Merolli *et al.*, 2013). The lack of a group "champion" and a proper structure may make it difficult for social media research to be replicated (Table I).

As can be seen from synthesizes, shown in Table I, there have been several research studies on the topic of online support group. However, these research studies are different than this current research in terms of their research questions, findings and methodology used. Despite being research on online support groups, several of these research studies are focused on groups such as gaming group, sexual abuse or general health issues. It is important to understand that the research on online social support group does not necessarily imply research on OSHSG. Also, some of the online social support groups are focused on short-term illness or diseases. They are not related to chronic disease management which often implies a long-term and not a short-term informational or emotional support requirements. Thus, the implications may vary depending on the type of the online support group studied. Also, several of these previous research studies are systematic reviews or content analysis. This current study is empirical in nature and focused on collecting the patient's information through a survey.

3. Theories and hypotheses
3.1 Theory of need to belong
People are a social being that has a need to form and maintain at least a minimum quantity of lasting, positive and significant interpersonal relationships (Baumeister and Leary, 1995). Human beings have a need to connect to other beings and to a certain group (Leary *et al.*, 2007). At a core level, people are self-motivated to affiliate with others in one or the other way. Online social group fulfills such fundamental human need by allowing people and patients to share and express their knowledge, gain social approval and prestige and create a distinct community of self-minded people. Schutz (1966) states that there are three basic needs that determine people's group-seeking behavior: inclusion, which implies need to belong to a compatible group; affection, which implies the need to be loved and seek for status and prestige; and control, which implies the need to give others power over self or have power over others by sharing ore receiving quality information and knowledge.

Source	Context	Research methodology	Independent variables	Dependent variables
Partridge *et al.* (2018)	Chronic disease	Qualitative Theory based	N/A	Chronic disease management
Wu *et al.* (2018)	Doctor consumer interaction	Survey design	Satisfaction, trust, interaction	Information seeking, information using intention
Kang (2017)	Breast cancer	Content analysis	Anonymity, identification	Support
De Choudhury and Kıcıman (2017)	Suicidal ideation risk	Content analysis	Language during conversation, Linguistic cues	Risk to suicidal ideation
Monroe *et al.* (2017)	Online social support tools to an adult walking program	Randomized Controlled Trial	Resources and Support	Improvement in walking activities
Britt (2017)	Crohn's disease or ulcerative colitis	Content analysis	N/A	Social support
Andalibi *et al.* (2016)	Sexual abuse	Content analysis of Redditt posts	Emotional disclosure, Gender, Attitude	Support-seeking behavior
Dwarswaard *et al.* (2016)	Patients with chronic conditions	Thematic synthesis of qualitative studies	Instrumental, psychosocial, and relational support	Self-management of chronic condition
Smailhodzic *et al.* (2016)	Patients	Systematic literature review	Emotional, information, esteem, network support, and emotional expression	Self-management and control, psychological and subjective well-being
Oh and LaRose (2016)	Psychological and social support	Laboratory experiment on undergraduate students	Impression management, Message composition time	sophistication in the support-seeking CMC message
Ahadzadeh *et al.* (2015)	Health-related internet use	Online survey of Urban women	Health risk, health consciousness, severity of chronic disease, and susceptibility to disease	Health-related internet use
Patel *et al.* (2015)	Chronic disease	Systematic review	Social, emotional, and experiential support	Improve patient care
Chiu *et al.* (2015)	Online social support for well-being	Online survey of expectant mother group and group with life stress	Subjective well-being, social support, prestige, self-esteem, identification	Online community citizenship behaviors
Lin *et al.* (2015)	Groups focusing on Pregnancy	Online and paper survey	Action facilitating support, Nurturant Support, Identification, Self-efficacy	Willingness to offer support
Himelboim and Han (2014)	Twitter prostate and breast cancer communities	Theoretical approach	N/A	Predict and explain patterns of information exchange

Table I.
Summary of the literature review

(*continued*)

Source	Context	Research methodology	Independent variables	Dependent variables
Park *et al.* (2014)	Online investment communities	Survey design	Intention to share, intention to seek, reputation, sense of belonging, knowledge	Information sharing behavior, information seeking behavior
Mota Pereira (2014)	Antidepressant therapy	Randomized control trail of three groups	Participation on Facebook	Depression
Yoo *et al.* (2014)	Breast cancer	Content analysis, Hierarchical regression analysis	Emotional communication competence, emotional support	Emotional well-being
Oh *et al.* (2013)	Health-related support	Online survey of undergraduate students	Information seeking, emotional, network, and tangible support	Health self-efficacy
Merolli *et al.* (2013)	Chronic disease	Systematic review	Health outcomes, effects and affordances of social media	Chronic disease management
Kim *et al.* (2013)	Explore Facebook use by Emergency Physicians	Cross-sectional with content analysis	N/A	Use of online social networking for cardiovascular care
Embuldeniya *et al.* (2013)	Chronic disease	Synthesize qualitative literature		Perceived impact and experience of participating in peer support interventions
Wang *et al.* (2012)	Online health support groups	Machine learning for content analysis	Emotional, Informational support	Retention of membership

Table I.

Such need to belong has several common themes across the literature. For example, Rogers (1951) identified belonging as a need to be regarded in a positive way by others. This includes increment in external prestige and status among friends, family and peers. Friedman (2007) defined a sense of belonging as the development of the self and identity building. People want to be associated and identified with something they feel is distinct and yet compatible with their behaviors and need. The participation with or proximity to others has little to do with the sense of belongingness (Allen and Kern, 2017). Rather, it relies on perceptions about the quality of social interactions or the knowledge being shared. This fulfills an individual's innate psychological drive to belong to groups, take part in meaningful social interactions with groups that are socially compatible with their psychological needs (Baumeister and Leary, 1995). Based on this overall generic perspective on the need to belong theory, this paper looks into details of the following related constructs.

3.1.1 *SoC and belongingness*. In the case of an online social community, a sense of belongingness is also referred to as a SoC (Koh *et al.*, 2003). The SoC is a feeling that members have of belonging to a group, a feeling that members matter to each other and to the group and a shared belief that members' needs will be met through their commitment to be together (McMillan, 1976). The SoC and belongingness that an individual has toward an online social group will determine if an individual would like to remain to be a part of the group. The SoC creates a sense of identification which elicits a sense of oneness toward the social group and motivates the individual to accept the group's perspective as his own (Van Knippenberg, 2000)

and be attached to the fate of the group (DeConinck, 2010). It also influences the citizenship behavior beneficial to the group which often leads to continued use of the online social support group. The sense of belongingness to a community is a fundamental motivation that comes from several factors including perceived knowledge quality, external prestige, the distinctiveness of the group and the compatibility of the group. The SoC brings a strong sense of attachment of the members to the community that inspires them to absorb and participate with the community. Thus, it positively affects a member's engagement behaviors in the online community. Based on community psychology research, this paper proposes that individuals would continue using the online social group as long as they feel a sense of belonging to this group (Hou and Fan, 2010; Park *et al.*, 2014; Bernardi and Wu, 2017):

H1. SoC will be positively associated with intention to continue using OSHSG for chronic disease management.

3.1.2 Knowledge quality. While the term knowledge quality has been defined differently throughout literature, the general consensus is it specifies the quality of content shared in an online health community and drives knowledge sharing in it (Yoo *et al.*, 2002). OSHSGs are social circles where members have the opportunities to interact and share their experiences, information and knowledge about a medical condition. This allows the members to learn and increase their knowledge of how to manage their medical conditions (Rupert *et al.*, 2016; Merolli *et al.*, 2013). An individual feels a sense of belongingness to the group only when they believe that the knowledge quality shared on the group meets a certain standard. The quality of the knowledge from the group reduces their perception of risk of participating in the online community (Shiue *et al.*, 2010). If an individual feel that there is a risk of loss of time and opportunities participating in the group because of the lack of knowledge quality, the individual would feel that he does not belong to the group. Thus, the perception of the group members in the utility of the group in addressing their needs is vital and may decide if they belong to the community to share the knowledge (Chiu *et al.*, 2011). Through the process of knowledge validation, the group members participate in the process of validating if the community is legitimate and if they belong to it (Kazmer *et al.*, 2014; Bernardi and Wu, 2017). Hence, the following hypothesis is proposed:

H2. Knowledge quality (KQual) will be positively associated with developing a SoC toward OSHSG.

3.1.3 Perceived external prestige. Perceived external prestige implies the status and respect assigned by people outside of the group to this online social support group (Chiu *et al.*, 2015). It refers to the individual's assessment of the types of image or social value construed by others toward this group. Individuals seek positive social identities with others as it helps them to maintain their self-esteem (Hogg and Mullin, 1999). Individuals like to be identified and thus, belong to a group that is more socially valued (Chiu *et al.*, 2013). It is natural for a human being to be associated with a prestigious community to validate their perception of themselves. One of the primary reason for individuals to be a part of the community and share and absorb knowledge is their expectations of being seen as skilled, knowledgeable or respected (Butler *et al.*, 2002). People want to perceive themselves in a positive light which helps them satisfy both their self-enhancement and self-esteem (Hung and Lin, 2015; Kunda, 1999). Members develop a pride to be associated with such social communities to manage their chronic disease. Previous research studies have shown a positive relationship between perceived external prestige and the belongingness to the community (Jones and Volpe, 2011; Chiu *et al.*, 2015). Therefore, the following hypothesis is proposed:

H3. Perceived external prestige (Prest) will be positively associated with developing a SoC toward OSHSG.

3.1.4 Perceived community distinctiveness. Perceived community distinctiveness can be defined as the uniqueness of the online support group as compared to the other relative online support communities (Chiu *et al.*, 2015). People like to be associated with a distinct and unique group as it often allows them to incorporate the group's distinctive features with their own social identity and satisfies their need to accentuate their own distinctiveness (Dutton *et al.*, 1994). The need for distinctiveness is especially significant in the early stages of adoption and acceptance (Burns and Rayman, 1990) of the online social groups and thus, should not be ignored (Pan *et al.*, 2014). Each group has their own distinctive features that separate it from others. An online social health group with distinct useful and wider functions, such as individual chats, privacy, quizzes, polls and resources sharing can complement ones need of being distinctive. Similarly, the types of the information shared, the frequency of the sharing, and the chemistry between the individuals can also make the group distinct. The distinctiveness of social groups has been found to have a positive association with identification and belongingness (Jones and Volpe, 2011). Also, an individual's perception of the community distinctiveness of the online support community has been found to have a positive effect on his or her sense of identification and belonging to the community (Chiu *et al.*, 2015). Hence, the following hypothesis is proposed:

H4. Perceived community distinctiveness (Dist) will be positively associated with developing a SoC toward OSHSG.

3.1.5 Perceived compatibility. Perceived compatibility refers to the degree to which an individual perceives that the online social group is consistent and complement with the existing service channels, communication media, experiences and values (Chiu *et al.*, 2015). Compatibility is regarded as an antecedent of Rogers (1995) diffusion of innovation theory and is considered as a primary factor that influences on the penetration of innovative technologies. In the case of an OSHSG, individuals would like the group to be compatible with their personal needs, characteristics and habits. A technology that is compatible with the various aspects of an individual's experiences, work styles and need is more likely to induce feelings of familiarity, identity and belongingness (Agarwal and Karahanna, 2000). Compatibility with previous experiences and habits influence the speed of adoption of the technology, the group and the people within it. Thus, the following hypothesis is proposed:

H5. Perceived compatibility (Comp) will be positively associated with developing a SoC toward OSHSG.

3.2 Theory of empowerment

Empowerment is both a construct that results in value orientation linking individuals to goals and strategies and a theoretical model for decoding the process and outcomes of efforts to exert control and influence over decisions related to life, organization or a group (Zimmerman, 2000; Perkins and Zimmerman, 1995). Empowerment allows individuals to see a closer relationship between their goals, efforts and achievement (Mechanic, 1991). The term empowerment has different meanings in different sociocultural context often implying self-efficacy, power, independence and self-reliance. In the broadest possible sense, empowerment implies allowing an individual the power, authority and control over resources and decisions that affect one's life by providing the freedom and knowledge of choice and action (Ginige and Richards, 2012). In the context of online social support health group, empowerment is an outcome of interpersonal and collective social action. Individuals who engage in such groups receive action-facilitating support such as informational support and nurturant support such as emotional support which allows them to engage in the mutual empowerment of each other. Empowerment from this perspective is a dynamic health process that stresses tenaciously participating in a process of changing one's environment and taking control of it by recognizing

patterns and supports, and controlling your own well-being (Shearer and Reed, 2004). The empowerment in this context is a relational process where the patients understand the personal resources that they have, the social contextual resources that the support groups provide, and the identification of the desired health goals and the means to achieve them by participating in the OSHSG (Shearer, 2009). Thus, an empowerment in a community and social setting as the one in this research goes beyond individual's willingness to take help and incorporates the help received from the social group.

3.2.1 Patient empowerment. Patient empowerment refers to the process of acquiring confidence and ability to cope with own's disease and get a hold of it for a better management of it (Embuldeniya *et al.*, 2013). A patient becoming empowered in a social support community requires connecting with fellow peers, receiving their support of various types and utilizing it to manage the disease. The online social support groups provide autonomy to the individuals to manage their diseases without visiting a physical location to meet a healthcare professional. A patient empowerment would also mean that the patient would have a sense of entitlement to talk about the disease to someone else and be interactive from an informational and emotional perspective. The empowerment of individuals in a community setting has been proven at the past (Chavis, 1990). With the introduction and growth of online social support community, the empowerment of individuals because of these communities have also been proven in recent research (Barak *et al.*, 2008; van Uden-Kraan *et al.*, 2009). The online health community has consistently been empowering patients by satisfying their emotional and information health-related needs along with required education and remedies for disease management (Oh and Lee, 2012). Horter *et al.* (2014) found that online support groups empower patients by providing alternative support, strength and voice for expressing their opinion, and most importantly motivate them to participate in the group. Thus, the following hypothesis is proposed:

H6. Patient empowerment (PEmp) will be positively associated with intention to continue using OSHSG for chronic disease management.

3.2.2 Social support. Online social networks allow people to connect with each other by overcoming geographical and temporal boundaries and thus, empower people to search information or seek for psychological support at their convenience (Lin *et al.*, 2014). Allowing social support to the members is a key social value of any online social support groups. While social support does not have a universally accepted definition, it can be defined as an exchange of resources between two individuals or between members within a group that enhances the well-being of the resource receiver (Shumaker and Brownell, 1984). Social support makes people in the group believe that they are cared, loved, esteemed and are a part of the community. It is a process that makes people feel confident and good about their physical and mental health and well-being as they are often provided by people with similar life experiences and situations. Previous research has consistently found that social support positively enhances the well-being of the members (Kumakech *et al.*, 2009; Miyata, 2002). Although social support lacks a universally accepted definition, the dimension that explains and define this construct has been fairly laid out. Social support has five dimensions: informational support, tangible support, emotional support, network support and esteem support (Cutrona and Russell, 1990). Based on Cutrona and Suhr (1994), these types of social support can be divided into two broad categories of action-facilitating support and nurturant support. The action-facilitating support implies actions such as informational support and tangible aids which helps individuals to solve or eliminate the problem caused by stress or disease. Nurturant support includes emotional, network and esteem support that assist in comforting or consoling individuals without direct efforts to solve the problem.

Informational support is the delivery of advice, factual input and feedback on certain problem or actions as required by the individual (Cutrona and Russell, 1990). Several individuals in an OSHSGs require information on certain issues such as disease or rashes or symptoms from other members who may have experienced it at past. The informational support is easier to receive from thousands of people who may have knowledge on a similar situation or conditions. Thus, the OSHSGs act as a human database of knowledge to solve problems and empower individuals with the freedom to receive information whenever and wherever they want from. Tangible support refers to the provision of needed goods, services or materials such as stroller to pregnant women or birthday party to a cancer patient as required by the individuals (Cutrona and Russell, 1990). Several OSHSGs allow the exchange of resources and materials if required by members. Some even allow to collect financial helps for birthdays or events if the group admin/"champions" feel is a desirable thing to do. As such, tangible support provides patients with empowerment to manage their situations within the group and be more comfortable with their life. van Uden-Kraan *et al.* (2009) in their research found that patients feel some extent of personal empowerment when they receive informational and tangible support from other group members in the online support health social group. Thus, this study proposes the following hypotheses:

H7. Informational support (Inf) will be positively associated with increasing patient empowerment.

H8. Tangible support (TanS) will be positively associated with increasing patient empowerment.

Emotional support refers to expressions of caring, concern, empathy and sympathy (Cutrona and Russell, 1990). It includes empathy for other members in the social group, support of emotional expression or reciprocation of emotions by others (Coulson *et al.*, 2007). Receiving emotional support from other members allow individuals to feel good about themselves and feel empowered. They feel they have someone who cares about them and have a "family" they belong to. These are the people with whom one can share feelings, concerns, health issues, and, and emotions. Network support is the presence of companions with whom to engage in shared social activities (Cutrona and Russell, 1990). The network category support dealt only with structural connections, as emotional connections are classified under emotional support (Coulson *et al.*, 2007). This allows members the freedom to rely on each other to perform certain activities together. One individual can trust another to solve problems or share values or interests as there is a bond between members. This empowers users by allowing them to find someone to rely on within the online support group. Esteem support refers to expressions of regard for one's skill, abilities and intrinsic value (Cutrona and Russell, 1990). It implies praise and compliments on abilities or attributes of individuals when facing stressful experiences (Coulson *et al.*, 2007). When in OSHSGs, one member may complement another on their ability to deal with problems or provide constructive comments on issues as such. This helps to develop a positive self-esteem and thus, a sense of empowerment. Coulson *et al.* (2007) found out in their study that group members most frequently offered informational (56.2 percent) and emotional support (51.9 percent) followed by network support (48.4 percent) with esteem support (21.7 percent) and tangible assistance (9.8 percent) least frequently offered. All these different nurturant support helps to empower individuals psychologically. van Uden-Kraan *et al.* (2009) in their research found that patients feel some extent of personal empowerment when they receive emotional, network and esteem support from other members OSHSG. Therefore, the following hypotheses are proposed:

H9. Emotional support (Emo) will be positively associated with increasing patient empowerment.

H10. Network support (NetS) will be positively associated with increasing patient empowerment.

H11. Esteem support (EstS) will be positively associated with increasing patient empowerment.

Based on the hypotheses proposed above, this study has developed the following research model that captures the concept stated above.

4. Research methodology
In order to test the relationship and hypotheses implied by the research model in Figure 1, this study applied a survey design for data collection through Qualtrics. In total, 12 variables as suggested by the research model were captured through items and instruments that were adapted from previous research.

4.1 Instrumentation
The questionnaire used for data collection for our measurement scales were based on empirically validated scales from previous studies. All instruments used in this study were adapted from existing measure to the context of OSHSG. All questionnaires were measured on a five-point Likert scale anchored between strongly agree and strongly disagree. The knowledge quality was assessed with six items adapted from McKinney *et al.* (2002) and Delone and McLean (2003). Perceived external prestige and perceived community distinctiveness were both assessed with four items each and adapted from Chiu *et al.* (2013). Perceived compatibility was assessed with six items each and adapted from Chiu *et al.* (2013). The SoC was assessed with five items adapted from Chiu *et al.* (2015). Informational support (four items), tangible support (four items), emotional support (four items), network support (four items) and esteem support (three items) were all adapted from (Lin *et al.*, 2015). Patient empowerment has three items adapted from Johnston *et al.* (2013). Intention to continue OSHSG has three items adapted from Venkatesh and Davis (2000).

An expert panel review consisting of few faculty members revised the survey. These members, who have several years of experience in survey design and similar research such as healthcare, information technology and consumer behavior, provided feedback on the survey. To assess the survey questionnaire's logical consistency, understandability and
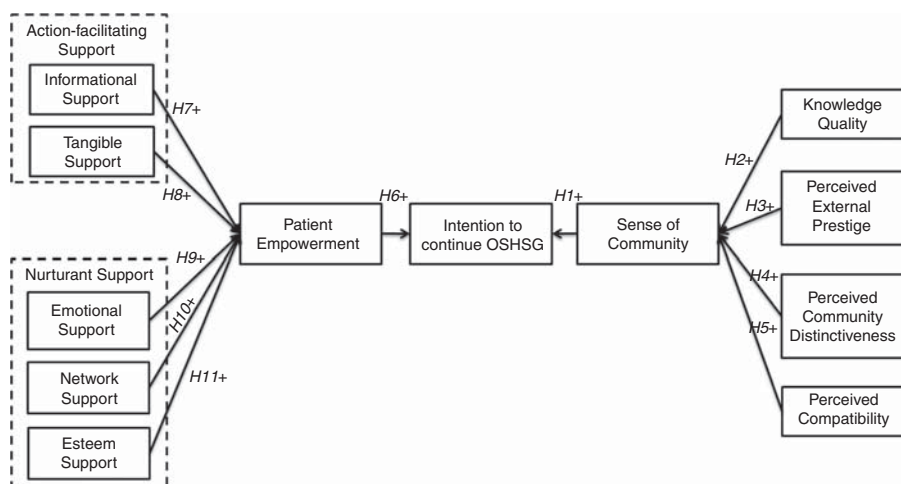
Figure 1.
Conceptual research model

contextual relevance, the revised survey was pretested with a group of ten students from an undergraduate class. Based on the feedback provided by the pre-test group, few changes related to ambiguities in instruments and word choices were made. The final revised survey was used for the primary data collection.

4.2 Sample administration

This study tests the hypotheses proposed using primary survey design method collected from multiple OSHSGs on social media such as Facebook. Data were collected via Qualtrics which is a web-based survey. The administrative head of each OSHSGs was asked for a request to post or provide us the permission to post the invitation for the survey with a hyperlink to our web survey. Only those online support health groups related to chronic disease management and with a strict privacy setting (i.e. closed groups) were chosen for this purpose. This way, it was easier to maintain quality of our responses by filtering out spam and collecting data from only those patients that have chronic disease (and not from those who join such groups to be observe), and thus, make the sample survey as representative as possible.

We reminded the members of these groups every two days to be a part of the survey. The survey was open for about ten days. The purpose of this study along with the declaration of the anonymity of the survey was clearly mentioned on the first page. The survey had a filter question to make sure that the participants taking the survey are actually the patients with the chronic disease. Our research model was capturing several constructs that required us to collect data only from the patients with the chronic disease. Those who failed the filter question were kicked out of the survey. Responses that were completed in unreasonable time, failed the attention checker questions, or were incomplete were deleted. The survey yielded a total of 246 usable responses. The survey was representative of both the genders as 53 percent of the survey respondents were female and 47 percent of the remaining respondents were male. The average age of the survey respondents was 34 years. The age ranged from 18 to 80 years old showing that overall representation of the population. In total, 43 percent of the respondents had an undergraduate degree, 37 percent had a graduate degree and the remaining respondents had high school or other degrees. The sample survey shows the ability to represent the population as respondents with variety of chronic diseases such as Alzheimer, Asthma, Cancer, Diabetes, Depression, Obesity and Lupus participated in the survey. The data were collected from more than ten different online social health communities.

5. Data analysis

5.1 Instrument validation

This study uses the Partial Least Squares (PLS) through SmartPLS 3.0 for instrument validation and testing of the structural model. As all of the instrument used in this research are all reflective scales, an exploratory factor analysis was conducted to calculate convergent and discriminant validity, Cronbach's α and composite reliability for this study. Convergent validity is confirmed when the items load higher on their hypothesized construct than any other constructs (Loch et al., 2003; Herath and Rao, 2009). After looking at the loadings and cross-loadings of the items and the Cronbach's α, one item of compatibility, one item of external prestige, one item of distinctiveness, two items of knowledge quality, one item of network support, one item of emotional support and two items of SoC were dropped. All other items that load together should show loading of 0.7 and higher (Chin et al., 2003). Also, the average variance extracted (AVE) for all the constructs should exceed the threshold of 0.5 for all the constructs used in the study (Fornell and Larcker, 1981). Further details can be seen in Table II.

	Comp	Dist	Cont	Emo	PEmp	EstS	SoC	Inf	KQual	NetS	Prest	TanS	AVEs
Comp1	0.806												0.629
Comp2	0.843												
Comp4	0.726												
Dist1		0.806											0.599
Dist2		0.763											
Dist3		0.751											
Cont1			0.833										0.701
Cont2			0.803										
Cont3			0.875										
Emo1				0.795									0.638
Emo2				0.792									
Emo4				0.810									
PEmp1					0.831								0.662
PEmp2					0.792								
PEmp3					0.817								
EstS1						0.763							0.620
EstS2						0.771							
EstS3						0.826							
SoC2							0.830						0.690
SoCn4							0.854						
SoC5							0.808						
Inf1								0.827					0.566
Inf2								0.744					
Inf3								0.687					
Inf4								0.747					
KQual3									0.861				0.628
KQual4									0.742				
KQual5									0.827				
KQual6									0.733				
NetS1										0.822			0.631
NetS2										0.766			
NetS4										0.795			
Prest1											0.803		0.660
Prest3											0.823		
Prest4											0.812		
TanS1												0.820	0.732
TanS2												0.832	
TanS3												0.856	
TanS4												0.911	

Notes: Comp, compatibility; Dist, distinctiveness; Cont, continuation; Emo, emotional; PEmp, patient empowerment; EstS, esteem support; SoC, sense of community; Inf, informational support; KQual, knowledge quality; NetS, network support; Prest, external prestige; TanS, tangible support; AVEs, average variance extracted

Table II.
Loadings,
cross-loadings, AVEs

Discriminant validity is established when the square root of AVE for each construct is greater than the inter-construct correlation corresponding off-diagonal correlations of the construct to their latent variables (Loch *et al.*, 2003). The square root of the AVE for each construct as shown in the diagonal of the correlation construct matrix in Table III was greater than the inter-construct correlation corresponding off-diagonal correlations of the constructs to their latent variables. Also, all factor indicators load on their corresponding factor stronger than on any other factor. Thus, all cross-loading differences are much higher than the suggested threshold of 0.1. This shows the presence of discriminant validity for the research model of our study.

	Cont	Comp	Dist	Emo	EstS	Inf	KQual	NetS	PEmp	Prest	SoC	TanS
Cont	0.837											
Comp	0.489	0.793										
Dist	0.534	0.574	0.774									
Emo	0.674	0.489	0.515	0.799								
EstS	0.577	0.537	0.573	0.670	0.788							
Inf	0.717	0.463	0.486	0.677	0.631	0.753						
KQual	0.663	0.625	0.694	0.585	0.585	0.650	0.792					
NetS	0.633	0.462	0.617	0.679	0.686	0.676	0.582	0.794				
PEmp	0.645	0.489	0.568	0.575	0.596	0.613	0.634	0.670	0.813			
Prest	0.515	0.527	0.588	0.559	0.580	0.540	0.594	0.544	0.590	00.813		
SoC	0.741	0.650	0.690	0.668	0.658	0.663	0.663	0.652	0.558	00.617	0.838	
TanS	−0.119	0.294	0.244	0.176	0.277	−0.265	0.147	0.129	0.179	00.273	0.174	0.855

Note: Values on the diagonal are the square root of AVE

Table III.
Inter-construct
correlations

Internal consistency is an important aspect of reflective constructs and, for this reason, Cronbach's α or composite reliability measures are used in this study to ensure the measures are reliable. Previous studies show that Cronbach's α is one of the most commonly used reliability assessment method (Petter *et al.*, 2007). A value of 0.70 and above in Cronbach's α and composite reliability is often considered as evidence of good reliability (Hair *et al.*, 2010). However, anything above 0.60 is acceptable. The reliability analysis for this study is presented in Table IV. The Cronbach's α for all the constructs except community distinctiveness is 0.70. As the value for distinctiveness is close enough to 0.70, no further action is taken. Also, the composite reliability values for all the constructs are well above 0.70.
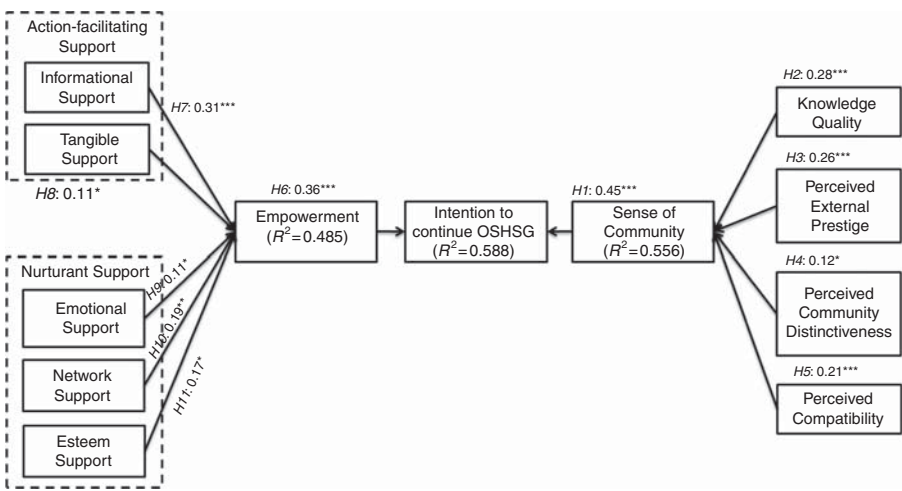
5.2 Testing of the structural model
Results of the structural model testing and the standardized PLS path coefficients for our research model and hypotheses related to it are presented in Figure 2 and Table V. Figure 2 presents the path coefficients and their significance levels. The model explained approximately 59 percent variance in the intention to continue OSHSG. Empowerment has an R^2 of 48 percent and a SoC has an R^2 of 56 percent. The path coefficient presented in the structural model in Figure 2 represents the strength of the relationship between the independent variables, mediating variables, and the dependent variables of the research model. As assumed, all of our hypotheses were significant toward the direction proposed in the research model.

	Composite reliability	Cronbach's α
Cont	0.8755	0.7864
Comp	0.8351	0.7073
Dist	0.8171	0.6661
Emo	0.8412	0.717
EstS	0.8299	0.692
Inf	0.8387	0.7441
KQual	0.8705	0.8008
NetS	0.8368	0.7082
PEmp	0.8543	0.7449
Prest	0.8536	0.7427
SoC	0.8698	0.7754
TanS	0.9159	0.896

Table IV.
Reliability statistics

Figure 2.
Results of structural
modeling test

Notes: *$p<0.05$; **$p<0.01$; ***$p<0.001$

Hypotheses	Path Coefficient (β)	t-value	p-value	Supported?
H1: Sense of community – intention (+)	0.4995	8.923	<0.001	Supported
H2: Knowledge quality – sense of community (+)	0.2868	4.049	<0.001	Supported
H3: Prestige – sense of community (+)	0.2577	3.552	<0.001	Supported
H4: Distinctiveness – sense of community (+)	0.1253	1.672	<0.05	Supported
H5: Compatibility – sense of community (+)	0.2181	3.269	<0.001	Supported
H6: Patient empowerment – intention (+)	0.3665	6.477	<0.001	Supported
H7: Informational support – patient empowerment (+)	0.3098	3.714	<0.001	Supported
H8: Tangible support – patient empowerment (+)	0.1083	2.001	<0.05	Supported
H9: Emotional support – patient empowerment (+)	0.101	1.666	<0.05	Supported
H10: Network support – patient empowerment (+)	0.1918	2.629	<0.01	Supported
H11: Esteem support – patient empowerment (+)	0.1743	2.078	<0.05	Supported

Table V.
Summary of findings

SoC was found to be positively associated ($\beta = 0.499$, $p < 0.001$) with the intention to continue using OSHSG for chronic disease management. Hence, H1 was supported. Knowledge quality was also positively associated with developing a SoC toward OSHSG. This supported H2 ($\beta = 0.286$, $p < 0.001$). Our data analysis also found perceived external prestige to be positively associated with developing a SoC toward OSHSG. Thus, H3 was supported ($\beta = 0.257$, $p < 0.001$). H4 which assumed to have perceived community distinctiveness to be positively associated with developing an SoC was found to be significant ($\beta = 0.125$, $p < 0.05$). H5, which states perceived compatibility to have a positive impact on the SoC toward OSHSG was also found to be significant ($\beta = 0.218$, $p < 0.001$). H6 that assumes that patient empowerment will be positively associated with intention to continue using OSHSG for chronic disease management was significant based on our data analysis ($\beta = 0.366$, $p < 0.001$). Our study also found that informational support is positively associated with increasing patient empowerment, thus, supporting H7 ($\beta = 0.309$, $p < 0.001$). As expected, tangible support also has a positive association with patient empowerment ($\beta = 0.108$, $p < 0.05$). This supports H8. H9 which assumes emotional support to be positively associated with increasing patient empowerment was also found significant

($\beta = 0.101$, $p < 0.05$). Our study also assumed that network support is positively associated with increasing patient empowerment ($\beta = 0.191$, $p < 0.01$). Thus, *H10* was also supported. *H11* of our study assumes that esteem support is positively associated with increasing patient empowerment. This hypothesis was also supported ($\beta = 0.174$, $p < 0.05$).

6. Discussion and implications
The purpose of this study is to understand how the action-facilitating support and nurturant support would empower the patients and would motivate users to continue using OSHSG. This study also analyzes how the need of these patients to belong to a community which arises from their need of external prestige, compatibility with the group, knowledge quality and community distinctiveness impact their willingness to continue using OSHSG. The findings of this study support all the hypotheses that have been proposed and posits the importance of patient empowerment and a SoC for users of the health group to continue to be a part of it.

6.1 Key findings
All of the relationships proposed in this study were found to be significant. The primary findings from this study indicate that the informational support – not the nurturant support such as emotional, network, and esteem support – are the major types of support people are seeking from an online social health support community. While the emotional, network and esteem support are important for members to continue using these communities to manage their chronic disease, the accuracy, speed and timing of the information that they receive from these communities are prioritized even more by the members. This finding is consistent with several other studies related to the online social community (Nambisan, 2011; Lin *et al.*, 2015).

This research also found that patient empowerment would positively impact their intention to continue using the online health community. A patient who feels that they have control over their own chronic health and can manage it because of the support they are receiving from the online health community would continue using the community. This finding is similar to previous research which found that patients are motivated to self-manage their disease and take power back from the healthcare professionals because of the cost and time associated with it (Rochman, 2010).

This research also found a significant relationship between SoC and the intention to continue using online health social network. Human beings have a fundamental need to belong and a need to have an interpersonal connection with others. When they feel that they have a community that they can rely on and identify with, people tend to enjoy their membership in the online health community. The SoC generates a sense of attachment toward the community. Our findings are consistent with the previous research that studied in the online social group (Hou and Fan, 2010; Park *et al.*, 2014; Bernardi and Wu, 2017).

This study also found the positive relationship of knowledge quality, perceived external prestige, perceived community distinctiveness and perceived compatibility with the SoC. Knowledge quality was found to be positively associated with developing a SoC toward OSHSG. Knowledge quality allows members to validate if the community is legitimate and if they belong to it (Kazmer *et al.*, 2014; Bernardi and Wu, 2017). The study also found perceived external prestige to be positively associated with developing a SoC toward OSHSG. Members of a community only want to belong to the community if they believe that the community is assigned a certain status and respect by external members. This research is in line with previous research that found a positive relationship between perceived external prestige and the belongingness to the community (Jones and Volpe, 2011; Chiu *et al.*, 2015). Also, this paper found that perceived distinctiveness is positively associated with developing a SoC toward OSHSG. Individuals like to be associated with a distinct and

unique group as it often allows them to integrate the group's distinctive features with their own social identity and satisfies their need to accentuate their own distinctiveness (Dutton *et al.*, 1994; Chiu *et al.*, 2015; Jones and Volpe, 2011). Our research also found perceived compatibility to be positively associated with developing a SoC toward OSHSG. Previous research shows that a technology that is compatible with the various aspects of an individual's experiences, work styles, and need is more likely to induce feelings of familiarity, identity and belongingness (Agarwal and Karahanna, 2000).

6.2 Implications for theory
This study aims to make the following two primary theoretical contributions. First, the concept of social support has been available for many years. However, much of the scholarly effort surrounding this concept has been used in relation to offline social support or general social media. This study helps to expand the existing literature to understand the role of the different types of the support for chronic disease management as the use of online social group as a health support group for chronic disease management is still in its infancy, with robust and consistent evidence on the outcome yet to be available (Partridge *et al.*, 2018). Second, this study expands the concept of patient empowerment and creating an SoC in regard to online social health support community. Apart from the limited research on knowledge contribution (Zhao *et al.*, 2015) and organizational citizenship behavior (Lin *et al.*, 2015), an online social health support community, the concept of patient empowerment and SoC has only been studied in relation to non-health online communities.

6.3 Implications for practice
This study also expects to provide some useful practical contributions. This study found that the informational support is valued relatively more than the nurturant support. While this does not mean that the nurturant support should be ignored, it certainly implies that the community should be designed as such that it is easy to share important information and eradicate inaccurate information.

This study also helps the community managers or webmasters to understand that patient empowerment is a key factor. Members visit online health communities to make sure that they are in charge of the management of their chronic disease. They need to feel empowered and be able to manage their disease at their own convenience. Similarly, the administrative leader and all of the members of the community should also understand that continuing membership often implies feeling the SoC while being a part of it. Belongingness is a strong motivation to continue. People want to belong to a community that has better knowledge quality and prestige and is compatible with their needs. Health community managers and leaders may find these findings useful to maximize the impact of their communities on patients' health self-management.

6.4 Limitations and future research
This study utilized a survey design method to test the research model as the data were collected using a self-administered survey questionnaire. Thus, this research may have limited precision and realism. For future research, it strongly recommend utilizing mix research methodology, which may not always be practical, but maybe a necessity to offset the weakness of one method by the strength of another method (McGrath, 1995). The other limitation of this paper is the self-selection bias as the respondents self-selected themselves to take the survey that was posted on online health communities. Future research can collect the data at different time periods to make sure that it covers as many generalizable respondents as possible. Future research can also collect data from several online portals with diverse background, education and culture to make the sample

more representative of the population. Also, the data collected for this research are cross-sectional in nature. Future research may perform a longitudinal research study to prove these relationships better.

6.5 Conclusion

Human is social beings that have the inert need to share, communicate, support and belong. They also like to have a control of the situation including the management of their chronic disease (Assari, 2017). The synergy between the social media and the medical field has changed how healthcare consumers to build their self-care and health management skills (Seçkin, 2011). It has empowered people to manage their disease from the comfort of their home which is often easy, speedy and not so costly. This study attempts to expand the conceptual horizon of social support by studying the impact of activity-facilitating support and nurtured support on empowering patient so that they continue using the online health community to manage their chronic disease. This study also integrates the concept of SoC and belongingness in the online health community. Our findings indicate that the action-facilitating support and nurturant support has a direct positive impact on patient empowerment which further positively impacts an individual's decision to continue online social health community. Similarly, the SoC generated by knowledge quality, perceived prestige, the distinctiveness of the community and perceived complementary were also found to positively impact continuing online social health community. This empirical research will extend the social support theory and help understand the importance of empowerment and SoC in such social support group. More efforts should be extended in understanding the actual continuation of an individual's participation in the community by engaging in a longitudinal research.

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Appendix 1

Core constructs	Definition adapted to this study	Adapted source
Informational support	Defined as the delivery of timely advice, factual input, and speedy feedback on certain problem or actions as required by the individual in the social health group	Cutrona and Russell (1990)
Tangible support	Refers to the provision of needed goods, services, or materials such as stroller to pregnant women or birthday party to a cancer patient as required by the individuals in the social health group	Cutrona and Russell (1990)
Emotional support	Refers to expressions and reciprocation of emotions, care, concern, empathy, and sympathy in the social health group by others	Cutrona and Russell (1990) and Coulson *et al.* (2007)
Network support	Defined as the presence of companions with whom to engage in shared social health activities to share joys, pain, problems, and values	Cutrona and Russell (1990) and Coulson *et al.* (2007)
Esteem support	Refers to praise and compliments for one's skill, abilities, attributes, and intrinsic value of individuals when facing stressful experiences	Cutrona and Russell (1990) and Coulson *et al.* (2007)
Patient empowerment	Refers to the process of acquiring confidence and ability to cope with own's disease and get a hold of it for a better management of it	Embuldeniya *et al.* (2013)
Intention to continue OSHSG	Consumers' intention to continue using online social health support group	Venkatesh and Davis (2000)
Sense of community	Refers to the feeling of members that they belong to the group, share similar values as others, fit-in to each other and to the group, and their needs will be met through their commitment to be together	McMillan (1976)
Knowledge quality	Defined as the quality of content shared in an online health community often determined by how easy, accurate, complete, reliable and timely the information content shared is	Yoo *et al.* (2002)
Perceived external prestige	Refers to the individual's assessment of the types of image, respect, status or social value construed by others towards this health group	Chiu *et al.* (2015)
Perceived community distinctiveness	Defined as the uniqueness of the online support group as compared to the other relative online support communities	Chiu *et al.* (2015)
Perceived compatibility	Refers to the degree to which an individual perceives that the online social health group is consistent and complement with his experiences, values, and medium of communication	Chiu *et al.* (2015)

Table AI.
Constructs used

Appendix 2. Questionnaire and items

Background information

Dear Respondent,

You are invited to participate in a study that helps to understand the factors that motivate people to participate in closed Online Health Community on Facebook Page where you can ask health-related questions to other individuals. This survey is only for people who participate in Online health community such as the one that this link is currently posted in. If you are in this group for someone else, and not for your own disease, we kindly request you not to participate in this survey.

While this study is not of a medical in nature, this study helps us understand how people manage their chronical diseases through participation in Online Health Community.

Your decision to participate or decline participation in this study is completely voluntary and if you do not wish to complete this survey just close your browser.

You must be 18 years or older to participate in this study. This survey will take approximately <u>8 minutes</u> of your time.

Please click NEXT (>>) to continue.

Filter question

Select the statement that fits you from the following:
- o   I have never joined and/or participated in any Facebook health community group, or patient community group such as WebMD, and PatientsLikeMe.
- o   I have joined and/or participated in Facebook health community group, or patient community group such as WebMD, and PatientsLikeMe.

Please click NEXT (>>) to continue.

Items (Constructs and source information not provided in actual survey)

Constructs	Items	Source
Informational support	Members of the online health community offer me accurate and speedy suggestions and advice about how to cope with my health-related problems	Lin *et al.* (2015)
	Members of the online health community tell me accurate and speedy information on what they did in a situation similar to mine	
	Members of the online health community answer my questions about my health timely	
	Members of the online health community tell me where I can go to get help for my health-related problems	
Emotional support	Members of the online health community make me feel that they care about me	Lin *et al.* (2015)
	Members of the online health community listen to me talk about my private feelings and emotions	
	Members of the online health community express concern about my wellbeing	
	Members of the online health community care about my feelings and my health condition	

Tangible support	Members of the online health community loaned or gave me things I need (e.g., medicine, clothes, items, toys, diapers, etc.)	Lin *et al.* (2015)
	Members of the online social group loaned or gave me items I may need	
	Members of the online health community loaned or gave me things that I need for myself	
	Members of the online health community exchanged things with me	
Network support	There are some members of the online health community with whom I share common values or interests	Lin *et al.* (2015)
	There are some members of the online support group who were going through some of the same things that I was	
	There are some members whom I trust to help solve my problems	
	There are some members of the online support group with whom I can share joys and sorrows	
Esteem support	Members of the online health community compliment my ability to deal with my problems	Lin *et al.* (2015)
	Members of the online health community agree with how I dealt with problems	
	Members of the online health community give constructive comments on my abilities to deal with problems	
Patient empowerment	Online health community provides me significant autonomy in determining how I manage my personal healthcare	Johnston *et al.* (2013)
	With online health community, I can decide on my own how to go about managing my personal healthcare	
	Online health community provides me considerable opportunity for independence and freedom in how I manage my personal healthcare	
Perceived external prestige	People think highly of this online health community	Chiu *et al.* (2013)
	This online health community has a good reputation	
	This online health community is looked upon as a prestigious online health community group to join	
	People generally regard your online health community as respected	
Perceived compatibility	Members of this community behave like me	Chiu *et al.* (2013)
	Members of this online health community think like me	
	Members of this online health community have a health situation similar to mine	
	Members of this online health community are from a social class similar to mine	
	Members of this online health community are like me	
	Members of this online health community have a health background similar to mine	
Community distinctiveness	When I think about this online support community, the availability of health-related information seems unique and wide as compared to other online health community	Chiu *et al.* (2013)
	The categories of discussion topics in this online support community are unique and wide compared to categories available at other competitive online health community	
	The social climate in this online support community is unique and wide compared to other online health community	
	A wide range of supporting tools such as chat, photo-sharing, comments, direct mail, question posting, features are there for this online health community	

Sense of community	People on this online health community share the same values	Chiu *et al.* (2015)
	I feel at home on this online health community	
	People in this online health community get along with each other	
	I am sure I fit in with this online health community	
	I feel that I am a typical member of this online health community	
Knowledge quality	The knowledge shared by members of this online health community is relevant to the topics	Mckinney *et al.* (2002)
	The knowledge shared by members of this online health community is easy to understand	
	The knowledge shared by members of this online health community is accurate	
	The knowledge shared by members of this online health community is complete	Delone and McLean (2003)
	The knowledge shared by members of this online health community is reliable	
	The knowledge shared by members of this online health community is timely	
Intention to continue	I intend to continue using online health community over the near future	Venkatesh and Davis (2000)
	I expect to continue using online health community over the near future	
	I would like to continue using online health community over the near future	

Demographic information

(a) What's your age? Put a number below (in years).

(b) Your level of education:
  o High school or less
  o Undergraduate
  o Masters
  o Ph.D.
  o Others

(c) Your Gender
  o Male
  o Female

(d) How long have you been participating in online health community? Put a number below (in years).

(e) What kind of health issues do you have for which you are participating in Online Health Community?

(f) What is your health status for the health issue for which you are participating in online health community?
  o Good
  o Bad
  o Very good
  o Very bad

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